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## Turkmenistan

*Turkmenistan is important to world energy markets because it contains over 100 trillion cubic feet of proven natural gas reserves. It also borders the Caspian Sea, which contains major oil and gas reserves.*

*Information contained in this report is the best available as of June 2001 and is subject to change.*



### GENERAL BACKGROUND

Turkmenistan, a largely desert country bordering the Caspian Sea in Central Asia, possesses the world's fifth largest reserves of natural gas and substantial oil resources. Following the collapse of the Soviet Union, Turkmenistan suffered a significant drop in its gross domestic product (GDP), although less than other former Soviet states because its economy received a boost from higher oil and gas prices and a sharp increase in hard currency earnings. Still, Turkmenistan's economy, which is concentrated mainly in oil, natural gas, and cotton, declined steadily from independence in 1991 until 1998, including a huge 25.9% decline in 1997 when [Russian](#) gas giant Gazprom denied Turkmenistan access to its pipeline network over a payment dispute. At the time, Russia's pipeline network was Turkmenistan's only gas export option.

Since 1998, Turkmenistan's economy has been staging a partial recovery. In 1999 and 2000, buoyed by increased gas exports and higher world oil and gas prices, Turkmenistan's economy grew sharply, by 12% and 17%, respectively. Resolution of the payment dispute with Gazprom led to the resumption of natural gas exports from Turkmenistan to other Commonwealth of Independent States (CIS) countries in 1998, and continued high world oil and gas prices have contributed to a surge in the country's GDP in the past three

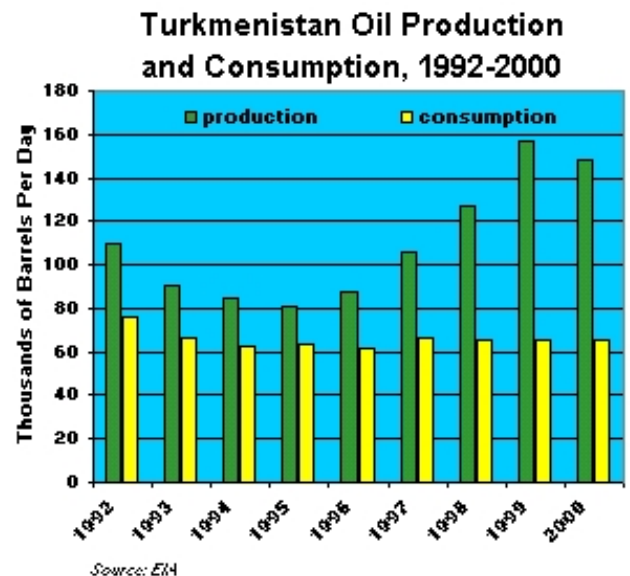
years.

Even if Turkmenistan achieves predicted real economic growth of 6% in 2001, the country's GDP still would be only 59% of 1990 levels. President Saparmurat Niyazov, a former communist who has ruled Turkmenistan since independence and was named president for life in 1999, has stifled political and economic reform. The country is burdened by having to service \$2.1 billion in foreign debt, most of it short-term, but thus far Turkmenistan has shunned assistance from the International Monetary Fund. Privatization goals remain limited, with President Niyazov ruling out privatization of the oil and gas sector until 2015 at the earliest. Foreign direct investment, over 90% of which flows into the country's oil and natural gas sectors, has slowed over the past few years, owing to the restrictive conditions that Turkmenistan attaches to foreign investment.

Turkmenistan is moving slowly to attract additional foreign investment in order to develop its vast oil and gas resources. In addition to the lack of financing, Turkmenistan's ability to develop its oil and gas reserves has been hindered by its geography. Turkmenistan is landlocked, bordering the landlocked [Caspian Sea](#) to the west, [Uzbekistan](#) and [Kazakhstan](#) to the north, [Afghanistan](#) to the east, and [Iran](#) to the south. Until recently, Turkmenistan's only export option for oil and gas was to the north via Uzbekistan, Kazakhstan, and Russia. Although Turkmenistan is working to diversify its export options, these will take many years to realize, and Turkmenistan is facing short-term revenue shortfalls. In addition, the still unresolved [legal status of the Caspian Sea](#) has limited Turkmenistan's ability to court foreign investors to develop the country's offshore oil and gas potential.

## **OIL**

Turkmenistan's oil production, which fell after independence to a low of 81,000 barrels per day (bbl/d) in 1995, increased to 156,400 bbl/d in 1999--nearly double its 1995 level--before slipping to 148,000 bbl/d in 2000. Turkmenneft, the state-run oil company, accounts for most of the oil extracted in Turkmenistan, producing 90.5% of the country's total in 2000. Turkmengaz, the state gas concern, extracted another 3% of the oil produced, while foreign companies operating in Turkmenistan under production-sharing agreements accounted for the remaining 6.5%. Turkmenistan has proven oil reserves of 546 million barrels, with possible reserves (mainly in the western part of the country and in undeveloped offshore areas in the Caspian Sea) of up to 1.7 billion barrels.



Turkmenistan has announced plans to increase oil production to 200,000 bbl/d, with additional output due to come from newly developed wells in the west of the country. Over the first four months of 2001, the country's oil production, including gas condensate, was up by 10% to 150,000 bbl/d in comparison to the same period in 2000. Of this amount, Turkmenneft accounted for approximately 139,000 bbl/d of the oil produced. Under a 10-year program dictated by President Niyazov, the former Soviet Central Asian state aims to raise crude oil production to nearly 1 million bbl/d by 2010. To do this, however, substantial foreign investment in the country's oil infrastructure will be needed.

## **Foreign Investment Restrictions**

In late 1993, Turkmenistan announced a long-term plan to develop its oil and gas industry that stressed the importance of drawing investment to the industry. In June 1998, President Niyazov signed a resolution providing for restructuring of the oil and gas activities of the Ministry of Oil and Gas into five state-owned companies: Turkmengeologia (exploration); Turkmenneft (oil production), Turkmenneftgazstroi (oil- and gas-related construction); and Turkmenneftgaz (oil and gas marketing). Turkmenrozzgaz, in which the

Turkmen state is the majority owner (with a 44% stake owned by Gazprom), is responsible for gas exports through Russia.

While Turkmenistan has attempted to ease restrictions on foreign investment, many layers of bureaucratic regulation remain in place. In addition, Turkmenistan maintains prohibitive rules that prevent companies using subsurface resources to export hydrocarbons. Since foreign investors do not have access to export pipelines (state-run Turkmenneft, Turkmengaz, and Turkmenneftegaz currently own all of the country's pipelines), they are forced to sell oil and gas produced in Turkmenistan through the state commodities exchange or send it to refineries. Oil and gas are sold at fixed prices that are well below world market levels.

Petronas ([Malaysia](#)), which signed a production-sharing agreement (PSA) in 1996 for the Cheleken-1 oil and gas deposit, has suspended operations in Turkmenistan for more than a year. The company identified large gas deposits in 1999, but investment has been less than is needed since the deposit cannot be developed profitably under current export restrictions. Swap arrangements, such as [United Arab Emirate-based Dragon Oil's](#) small-scale swap agreement with Iran, have proved modestly successful, but the Turkmen government has pledged to work on legislation that will expand the opportunities for foreign investors to export oil and gas, a move that Turkmenistan hopes will lead to the larger levels of investment that are needed to boost the country's export capacity.

### Export Options

Turkmen officials plan to liberalize pipeline transport and to ease the tax burden on foreign investors for pipeline projects. One of the main obstacles hindering development of Turkmenistan's oil industry is the lack of export routes. While there are several [oil export pipeline options from the Caspian Sea region](#), Turkmenistan currently is not playing a major role in the debate, with much of the focus instead on Kazakhstan and [Azerbaijan](#). Without the ability to pipe its oil to world markets, Turkmenistan is forced to rely on tanker and rail arrangements.

Even after shipping its oil by tanker to Russia's Caspian Sea port of Makhachkala, however, securing pipeline access has been a problem. In 2000, Turkmenistan arranged with the Russian pipeline company Transneft to export up to 50,000 bbl/d use the Baku-Novorossiisk pipeline to export Turkmen oil. Since Turkmen oil has a relatively high content of sulfur and paraffins and high viscosity, Transneft determined it is not fit for the pipeline. In order to load the oil into the pipeline, Transneft built the Dagar processing complex so that the heavy Central Asian oil could be mixed with light West Siberian oil and brought up to the Urals export standard. However, oil companies and traders supplying oil from Central Asia refused to use the complex, and Transneft refused to ship it, leaving tankers loaded with Turkmen oil standing in port. Turkmenistan eventually accepted rail transportation of its oil.

Turkmenistan increasingly has turned to swap agreements with Iran in order to export its oil, with Turkmen oil being delivered to the Iranian Caspian port of Neka. The oil swaps began in July 1998. Dragon Oil, which produced 7,083 bbl/d in 2000 in a PSA with Turkmenistan, has exported its share of this production through a swap deal with Iran since 1998, and in April 2000 the company signed a new 10-year swap agreement with Iran. [U.S.](#) economic sanctions on Iran have prohibited American oil companies with investments in Turkmenistan from participating in the oil swaps; in April 1999, ExxonMobil's application for a license to swap Turkmen oil for Iranian oil was denied. ExxonMobil has a 40% stake in Turkmenistan's Burun field, which produced approximately 10,000 bbl/d in 2000, as well as a 52.4% interest in the Kotor Tepe/Barsa Gelmeh PSA and a share of the Garashsyzlyk PSA.

### Caspian Issues

In addition to the question of export routes, the five countries surrounding the Caspian Sea remain divided over who owns the resources in the seabed. The littoral states have yet to agree on a [legal framework governing the Sea's resources](#), with the [environmental risks](#) and potential oil and gas wealth heightening the stakes for each country (the Oil and Gas Industry and Natural Resources Ministry of Turkmenistan reported recently that oil and gas reserves in the disputed Turkmen sector of the Caspian Sea were estimated at 81

billion barrels and 194 trillion cubic feet--Tcf--respectively). Turkmenistan and Azerbaijan remain locked in a dispute over the Serdar/Kyapaz field, and, in addition, Turkmenistan claims that portions of the Azeri and Chirag fields--which Ashgabat calls Khazar and Osman, respectively--lie within its territorial waters. Turkmenistan has insisted that work at the Azerbaijan International Operating Company's concession at the Azeri and Chirag fields be stopped.

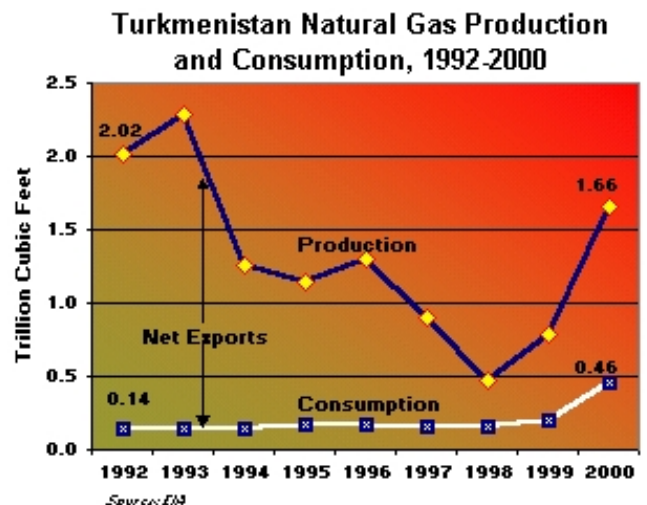
### Downstream and Refining

Turkmenistan has two refineries, located at Turkmenbashi (formerly Krasnovodsk) and Charjou, with total crude refining capacity of 237,000 bbl/d (116,500 bbl/d at Turkmenbashi and 120,500 bbl/d at Charjou). Both facilities are slated for modernization and expansion to meet the country's expected increases in oil production and demand. Work is underway on a \$1.4-billion upgrade and modernization of the Turkmenbashi refinery with financing from German and Japanese sources, scheduled for completion in 2004.

France's Technip was awarded a contract in July 1999 to build a lubricants blending plant at the Turkmenbashi refinery as part of the modernization. In April 2001, the catalytic cracking unit was launched by Technip and Iranian NINISC at a cost of \$300 million. The unit, with a capacity of 36,150 bbl/d, is designed to produce 920,000 tons (18,478 bbl/d) of high-octane gasoline, 255,000 tons (5,120 bbl/d) of diesel, 280,000 tons (5,623 bbl/d) of heating oil, and up to 345,000 tons (6,929 bbl/d) of liquefied petroleum gas annually. Complete reconstruction of the refinery will give Turkmenistan the ability to produce motor oil, lubricant, and polymers that reach world standard and allow it to be able to stop importing lubricating oils once the relevant production unit at the refinery is launched.

### NATURAL GAS

Turkmenistan has substantial natural gas reserves, and the country was a significant natural gas producer during the Soviet era. Although the country's gas sector is not fully developed and output dropped throughout the 1990s, Turkmenistan still produced 788 billion cubic feet (Bcf) of gas in 1999, rebounding from 1998 when Turkmenistan, locked in a pricing dispute with Russia over the export of Turkmen gas, produced a low of 466 Bcf. With high world gas prices and a Turkmen-Russian agreement on Turkmen gas exports, the country's gas production in 2000 skyrocketed to 1.66 Tcf. Turkmenistan plans to boost gas output to 2.47 Tcf in 2001, although the country's gas production totaled only 660 Bcf through the first four months of the year.



Turkmenistan contains proven natural gas reserves of between 101 Tcf. The largest natural gas fields are in the Amu-Dar'ya basin, with half of the country's gas reserves located in the giant Dauletabad-Donmez field. In addition to Amu-Dar'ya, Turkmenistan contains large gas reserves in the Murgab basin, particularly the giant Yashlar deposit, which contains an estimated 27 Tcf. In May 2001, Turkmengaz, which accounts for over 85% of the country's total gas production, started exploration and prospecting work on a new field in Darganata, northeastern Turkmenistan. Commercial exploitation of the Gagarinskoye deposit in Zaunguz Karakum is scheduled to begin soon, while resumption of work in the Samantepe field on the right bank of Amu Dar'ya in eastern Turkmenistan is planned. Under a presidential program, Turkmengaz also is stepping up exploratory work in the Karakum and Kyzylkum deserts.

### Exports

Domestic natural gas demand in Turkmenistan in 1999 was 198 Bcf, leaving the country with plenty of gas available for export. With the assistance of foreign investors, Turkmenistan is counting on its large gas reserves and potential exports to fuel its economic recovery. In 1999, Turkmenistan exported 0.6 Tcf of natural gas, but in 2000, spurred by a major gas export deal with Russia and the resumption of gas supplies



to Ukraine, the country more than doubled this amount. Turkmenistan exported 1.2 Tcf of gas in 2000, with 918 Bcf sent to Russia, 177 Bcf contracted to [Ukraine](#), and 106 Bcf piped to Iran.

Turkmenistan has plans to boost gas exports in 2001 to as high as 1.76 Tcf. Through April 2001, Turkmen gas exports totaled 451 Bcf, up 34% from the same period of 2000. However, analysts doubt that Turkmenistan will be able to reach its 2001 export goal as a result of a pricing dispute with gas trader Itera (Russia) that led to the cutoff of gas supplies to Russia at the start of 2001. In May 2000, the Russian and Turkmen presidents reached an agreement in principle on a 1.8-Tcf gas export deal for 2001-2002, but a final deal was held up by Turkmenistan's demand to receive \$40 per 1,000 cubic meters of gas. In the absence of a legal document governing exports for 2001, Turkmenistan cut off natural gas deliveries to Russia on New Year's Eve. In February 2001, Itera agreed to the price of \$40 per 1,000 cubic meters, but purchased only 350 Bcf for 2001. In 2000, Itera and Gazprom (Russia) together purchased 918 Bcf.

Turkmenistan's gas exports to Ukraine in 2001 may make up for the shortfall of exports to Russia. In October 2000, Turkmenistan agreed to resume the export of gas supplies to Ukraine that had been suspended in May 1999 because of the latter's \$281-million gas debt. The deal, which supplied Ukraine with 177 Bcf of gas in 2000 for \$38 per 1,000 cubic meters and an additional 1.06 Tcf in 2001 for \$40 per 1,000 cubic meters, requires Ukraine to make weekly advance payments of \$7 million in cash and \$9 million in goods in order to continue to receive gas supplies from Turkmenistan.

On May 14, 2001, Turkmenistan and Ukraine agreed to a major gas export deal through 2006. On a visit to Kiev, Turkmen President Saparmurat Niyazov and Ukrainian President Leonid Kuchma signed a deal in which Turkmenistan will provide Ukraine with 8.83 Tcf of gas between 2002 and 2006. Under terms of the deal, Turkmenistan will sell Ukraine 1.41 Tcf of gas at a price of \$42 per 1,000 cubic metres, and another 1.77 Tcf in 2003, with remaining deliveries to be agreed later. Turkmenistan said it would only sign the gas deal if Ukraine could make timely payments for supplies. Ukraine agreed to pay for the gas partly in cash and partly through participation in 20 construction and industrial projects in Turkmenistan worth a total of \$412 million.

Turkmen gas also is supplied to northern provinces in Iran, via the 124-mile Korpezhe-Kurt Kui pipeline, which opened in December 1997. The \$190-million pipeline, the first in Central Asia to bypass Russia, has a capacity of 141 Bcf, which is being expanded to 283 Bcf. In 2000, Turkmenistan exported 106 Bcf of gas to Iran via the pipeline, and in early 2001 the countries agreed that Turkmenistan will supply Iran with 212 Bcf at a price of \$40 dollars per 1,000 cubic meters, although 35% of delivered Turkmen gas is being allocated as payment for Iran's contribution to the project. Turkmenistan and Iran have discussed increasing gas sales, as well as eventually increasing the pipeline's annual capacity to 459 Bcf.

### **Gas Pipeline Issues and Options**

In order to reach its full gas export potential, Turkmenistan must solve the problem of getting its gas to consumers and getting paid in hard currency. The country has been unable to capitalize on its gas wealth because it lacks pipeline outlets to world markets. Currently, Turkmenistan must rely almost entirely on the Russian pipeline network and a pipeline link to Iran to get its natural gas exports to foreign markets. A number of [gas export pipeline options from the Caspian Sea region](#) are in development or under consideration.

In addition, with a lack of export options, Turkmenistan is forced to sell its gas to ex-Soviet states that either cannot pay fully in cash or are tardy with payments for supplies already received. In November 2000, Turkmenistan threatened to sue both Azerbaijan, which owed it \$58.9 million, and Kazakhstan, whose debts amounted to \$57.8 million, in an international court if the debts were not repaid immediately. Turkmenistan's gas export deal with Ukraine requires that Ukraine pay only 60% of gas supplies in cash (the other 40% of gas supplies will be paid in kind), while Turkmenistan's agreement with Itera for 2001 stipulates that half the payment will be in cash, the other half in barter.

Russia holds a virtual monopoly over Turkmenistan's gas export routes, and Itera already has threatened to

cease transportation of Turkmen gas into Ukraine since Ukraine owes Russia at least \$1.4 billion in gas debts. Turkmen gas in transit to Russia also passes through neighboring Uzbekistan and Kazakhstan, where pipelines have become run down in recent years. Thus, as part of its strategy to increase its natural gas exports, Turkmenistan is developing alternatives to Russia's pipeline network. The most important proposed project is the \$2-billion, 1,020-mile Trans-Caspian Gas Pipeline (TCGP), which would run from Turkmenistan under the Caspian Sea to Azerbaijan, through [Georgia](#), and then to [Turkey](#). The pipeline's initial gas throughput would be 565 Bcf, eventually rising to 1.07 Tcf.

TCGP has run into problems, and the future of the project is uncertain. Negotiations between Turkmenistan and the international consortium backing the project have stalled over payment and price issues, and Turkmenistan, Azerbaijan, and Georgia have yet to resolve some political issues. Although Royal Dutch/Shell continues to support the project, President Niyazov's plans to sell large volumes of gas to Russia and Ukraine every year appear to leave Turkmenistan with little gas left over to supply the TCGP. While the money from Turkmenistan's gas export deals with Ukraine and Russia will allow Turkmenistan to invest more in its gas sector and boost output, Turkey may not need additional gas supply, given that Russia's "Blue Stream" pipeline project to sell gas to Turkey is already underway. Also, on March 12, 2001, Azerbaijan and Turkey agreed to a 15-year deal by which Turkey will receive 3.1 Tcf of natural gas from Azerbaijan's Shah Deniz field.

In addition to Iran, other possible export routes for Turkmen gas include [China](#) and [Pakistan](#). In September 1998, a final deal between Turkmenistan and China to build a 4,161-mile gas pipeline linking the two countries was delayed due to unfavorable results from a preliminary feasibility study. A July 2000 meeting between the countries' presidents revived the idea, but no concrete action has been taken. A possible pipeline carrying gas from Turkmenistan across Afghanistan to Pakistan has also been considered, and in October 1997, Unocal set up the Central Asian Gas Pipeline (CentGas) consortium to build the pipeline. However, in early August 1998, Unocal announced that CentGas had not secured the financing necessary to begin the work, and on August 22, 1998, Unocal suspended construction plans due to the continuing civil war in Afghanistan. It is unlikely this project will move forward, considering the risks involved.

### **COAL**

Turkmenistan has no coal reserves and thus produces no coal. Although the country consumed a minimal amount of coal in the past (551,000 short tons in 1992), since the collapse of the Soviet Union, coal consumption has been rapidly phased out, dropping to zero in 1998.

### **ELECTRICITY**

Turkmenistan's power sector, while in need of repair to its deteriorating infrastructure, still provides the country with more than enough electricity to meet its needs. In 1992, just after independence, Turkmenistan generated 12.4 billion kilowatt-hours (Bkwh) of electricity while consuming 8.6 Bkwh. In 1999, as investment in maintenance of the sector's infrastructure continued to dry up, Turkmenistan generated just 8.4 Bkwh. With electricity demand decreasing over the 1992-1999 time period as well, however, Turkmenistan's power generation was still sufficient to meet the consumption level of 4.8 Bkwh. Preliminary figures from the Turkmen government show that the country produced 9.8 Bkwh in 2000, up 17% over 1999 levels, and the Ministry of Power Engineering and Industry has plans to generate 10.2 Bkwh in 2001.

With a power-generating capacity of 3.9 gigawatts (GW), 99% of which is thermal, Turkmenistan has the potential to boost its net electricity exports above the 3.6 Bkwh in net exports that were recorded in 1999. Most of the electricity that Turkmenistan exports is sent to southwestern Kazakhstan and northeast Afghanistan, although [Armenia](#), Turkmenistan, and Iran have discussed greater cooperation in the energy sphere. Discussions among the three countries have focused on connecting their power grids, thereby allowing the countries to exchange power if needed. In May 1998, Turkmenistan announced that a new 220-400 kilovolt power transmission line from Belek, Turkmenistan, would be extended through Kum-Dag, Madau, and Kizyl-Atrek to Turkmenistan's border with Iran, allowing it to export electricity to Iran. Armenia's power grid has been connected to Iran's since 1998.

**COUNTRY OVERVIEW**

**President:** Saparmurat Niyazov (since October 27, 1990, when the first direct presidential election occurred; Niyazov was unanimously approved as president for life by the Assembly (Majlis) on December 28, 1999); note: the president is both the chief of state and head of government

**Independence:** October 27, 1991 (from Soviet Union)

**Population (7/00E):** 4.5 million

**Location:** Central Asia bordering the Caspian Sea between Iran and Kazakhstan

**Size:** 188,455 sq. miles, slightly larger than California

**Major Cities:** Ashgabat (capital)

**Languages:** Turkmen (72%), Uzbek (9%), Russian (12%), other (7%)

**Ethnic Groups:** Turkmen (77%), Russian (6.7%), Uzbek (9.2%), Kazakh (2%), other (5.1%)

**Religions:** Sunni Muslim (89%), Eastern Orthodox (9%), unknown (2%)

**ECONOMIC OVERVIEW**

**Minister of Economics & Finance:** Orazmut Begmyradov

**Currency:** Manat

**Official Exchange Rate (4/13/01):** \$1=5,200 Manat

**Nominal Gross Domestic Product (2000E):** \$3.8 billion; **(2001E):** \$4.2 billion

**Real GDP Growth Rate (2000E):** 17.0%; **(2001E):** 6.0%

**Inflation Rate (2000E):** 3%; **(2001E):** 5.0%

**Current Account Balance (2000E):** -\$658 million

**Major Trading Partners:** Russia, Turkey, Ukraine, Azerbaijan, Iran, Germany, Kazakhstan, Uzbekistan

**Merchandise Exports (2000E):** \$1.96 billion; **(2001E):** \$2.55 billion

**Merchandise Imports (2000E):** \$2.22 billion; **(2001E):** \$2.38 billion

**Merchandise Trade Balance (2000E):** -\$258 million; **(2001E):** \$163 million

**Major Exports:** Oil and gas 55%, cotton (1998)

**Major Imports:** Machinery and equipment (45%), chemicals, foodstuffs (1998)

**External Debt (12/00E):** \$2.1 billion

**ENERGY OVERVIEW**

**Minister of Energy and Industry:** Amangeldy Atayev

**Minister of Oil & Gas Industry & Mineral Resources:** Gurban Nazarov

**Proven Oil Reserves (1/1/01E):** 546 million barrels

**Oil Production (2000E):** 148,000 barrels per day (bbl/d)

**Oil Consumption (2000E):** 65,000 bbl/d

**Net Oil Exports (2000E):** 83,000 bbl/d

**Crude Oil Refining Capacity (1/1/01E):** 237,000 bbl/d

**Natural Gas Reserves (1/1/01E):** 101 trillion cubic feet (Tcf)

**Natural Gas Production (1999E):** 0.79 Tcf; **(2000E):** 1.66 Tcf

**Natural Gas Consumption (1999):** 0.20 Tcf; **(2000E):** 0.46 Tcf

**Net Natural Gas Exports (1999E):** 0.59 Tcf; **(2000E):** 1.2 Tcf

**Coal Production (1999):** none

**Coal Consumption (1998E):** minimal (all imported)

**Electric Generation Capacity (1999E):** 3.9 gigawatts (99% thermal)

**Electricity Production (1999E):** 8.4 billion kilowatt-hours (Bkwh)

**Electricity Consumption (1999E):** 4.8 billion kilowatt-hours (Bkwh)

**Net Electricity Exports (1999E):** 3.6 Bkwh

**ENVIRONMENTAL OVERVIEW**

**Minister of Environmental Protection:** Matkarim Rajapov

**Total Energy Consumption (1999E):** 0.3 quadrillion Btu\* (<0.1% of world total energy consumption)

**Energy-Related Carbon Emissions (1999E):** 5.4 million metric tons of carbon (0.1% of world total carbon emissions)

**Per Capita Energy Consumption (1999E):** 64.0 million Btu (vs. U.S. value of 355.8 million Btu)

**Per Capita Carbon Emissions (1999E):** 1.2 metric tons of carbon (vs. U.S. value of 5.5 metric tons of

carbon)

**Energy Intensity (1999E):** 107,349 Btu/\$1990 (vs. U.S. value of 12,638 Btu/\$1990)\*\*

**Carbon Intensity (1999E):** 1.9 metric tons of carbon/thousand \$1990 (vs U.S. value of 0.19 metric tons/thousand \$1990)\*\*

**Sectoral Share of Energy Consumption (1998E):** Transportation (65.7%), Industrial (30.1%), Residential (4.1%), Commercial (0.0%)

**Sectoral Share of Carbon Emissions (1998E):** Transportation (67.1%), Industrial (29.1%), Residential (3.8%), Commercial (0.0%)

**Fuel Share of Energy Consumption (1999E):** Oil (41.5%), Natural Gas (58.5%), Coal (0.0%)

**Fuel Share of Carbon Emissions (1999E):** Oil (45.0%), Natural Gas (55.0%), Coal (0.0%)

**Renewable Energy Consumption (1998E):** 0 trillion Btu\*

**Status in Climate Change Negotiations:** Non-Annex I country under the United Nations Framework Convention on Climate Change (ratified June 5th, 1995). Turkmenistan ratified the Kyoto Protocol on January 11, 1999.

**Major Environmental Issues:** Contamination of soil and groundwater with agricultural chemicals, pesticides; salinization, water-logging of soil due to poor irrigation methods; Caspian Sea pollution; diversion of a large share of the flow of the Amu Darya into irrigation contributes to that river's inability to replenish the Aral Sea; desertification.

**Major International Environmental Agreements:** A party to Conventions on Biodiversity, Climate Change, Desertification, Hazardous Wastes and Ozone Layer Protection.

\* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar and wind electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.

\*\*GDP based on EIA International Energy Annual 1998

## **ENERGY INDUSTRY**

**Organization:** Turkmenistan's official government agencies responsible for natural gas operations, oil production, and exploration are Turkmengaz, Turkmenneft, and Turkmengeologia, respectively.

**Major Oil Fields:** Kotor-Tepe, Nebit-Dag

**Major Oil Refineries (1/1/01 Capacity):** Charjou (120,000 bbl/d); Turkmenbashi (formerly Krasnovodsk) (116,500 bbl/d)

**Major Gas Fields:** The Amu-Dar'ya region contains two supergiant fields (including Dauletabad-Donmez) and nine giant fields. Additional gas fields are located in the Kopet Dag Trough.

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*Sources for this report include: CIA World Factbook 2000; Economist Intelligence Unit ViewsWire; Oil and Gas Journal; Petroleum Economist; Radio Free Europe/Radio Liberty; Reuters; U.S. Department of Commerce's Business Information Service for the Newly Independent States (BISNIS); U.S. Energy Information Administration; WEFA Eurasia Economic Outlook.*

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## **Links**

For more information from EIA on Turkmenistan, please see:

[EIA - Country Information on Turkmenistan](#)

[EIA - Caspian Sea Region Country Analysis Brief](#)

Links to other U.S. government sites:

[2000 CIA World Factbook: Turkmenistan](#)



[U.S. Embassy in Turkmenistan](#)

[Radio Free Europe/Radio Liberty](#)

[RFE/RL: Energy Politics in the Caspian and Russia](#)

[U.S. Department of State Country Commercial Guide FY2000: Turkmenistan](#)

[U.S. Department of Energy Office of Fossil Energy: Turkmenistan](#)

[U.S. Department of Commerce's Business Information Service for the Newly Independent States \(BISNIS\): Turkmenistan](#)

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File last modified: June 25, 2001

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